The later years of Harvey's life were passed in peaceful retirement. The civil troubles of the time had broken up his household and scattered his patients, but had left his private fortune unimpaired. At the age of sixty-eight he relinquished his appointments and practice, and went to reside with one or other of his brothers, who were wealthy London merchants. He still continued the studies he loved so well—for he had an enduring passion for original research—and maintained his interest in the College of Physicians, to which he was a large benefactor.

Sir George Ent gives us a touching glimpse of him as he appeared in his seventy-third year at the house of his brother Daniel, at Combe.

> "I found him, Democritus like, busy with the study of natural things, his countenance cheerful, his mind serene, embracing all within its sphere. I forthwith saluted him and asked if all were well with him? 'How can it,' said he, 'whilst the Commonwealth is full of distraction and I myself am still in the open sea? And truly did I not find solace in my studies and a balm for my spirit in the memory of my observations of former years, I should feel little desire for longer life. But so it has been, that this life of obscurity, this vacation from public business, which causes tedium and disgust to so many, has proved a sovereign remedy to me.'"

Harvey had the satisfaction of living to see his great discovery generally accepted as true. In his old age he was known and honoured throughout the learned world. The College of Physicians erected a statue in his honour. In his seventy-sixth year he was elected president of the College, but declined the honour on the plea of the infirmities of age. Harvey made a peaceful ending in his seventy-ninth year, and was buried in what is now called the "Harvey Chapel" in the parish church of Hempstead in Essex.

Mr. Power has produced a work of permanent value, which is not likely to be superseded. The book is invitingly got up, and is eminently readable. It should attract a large circle of readers both inside and outside the professional pale. W. R.

THE NOTIONS OF CLASSICAL WRITERS ON GEOGRAPHY.

A History of Ancient Geography. By H. F. Tozer. Pp. xvii + 387. (Cambridge University Press, 1897.)

THE want of a short, popular history of classical geography is one which has been long felt, and there is no doubt that the little volume before us will help to fill it. The great work by the late Sir Henry Bunbury, from which Mr. Tozer has so largely drawn, is hardly fitted for a text-book, even for advanced students, for the subject of ancient geography is treated therein in such an exhaustive manner, that no ordinary student who has other subjects to master can ever hope to have sufficient time to study it in the way in which it should be studied. It is somewhat a matter of doubt if Mr. Tozer's, with its three hundred and seventy pages of closely-printed matter, is not too long when the absolute needs of the student are taken into consideration; still the reader will soon see how to pick out the important facts from this pleasantly written treatise, and how to let alone the generalisations and discussions of theories which though interesting enough are not essentials.

The first thing that strikes the reader is the fact that Mr. Tozer has described his work inaccurately; it is not a "History of Ancient Geography," but a "History of Ancient Classical Geography." In days gone by when Oriental studies had not attracted the attention of workers, and the works of Greek and Latin writers were believed to contain all the history of the nations that are past and gone, the title which Mr. Tozer has given to the work would have been well enough; in these days, however, it is misleading. On p. 3 Mr. Tozer says:

> "The natural starting-point for such a history must be the shores of the Mediterranean, because the peoples that dwelt in the neighbourhood of that sea first cultivated the science of geography on an extended scale, and it was from that quarter that the information was originally derived which furnished the material for such a study."

Very true as far as it goes, but Egypt and Syria both form part of the Mediterranean coast on the south and east, and yet Mr. Tozer's book tells us next to nothing about either, although so much is now known of both countries, and of the ancient intercourse which existed between them in very old times. Hieroglyphic inscriptions are extant which describe military and other expeditions to the heart of Africa and to the coasts of Arabia from the period of the sixth to the eighteenth dynasty, and several long historical texts which describe the progress of Egyptian arms in Western Asia are so well known as to make it difficult to see why Mr. Tozer has not made use of them. The Tell el-Amarna tablets, which have now been translated into English, French, and German, form a most valuable mine of information for the student of ancient geography, and yet they are not mentioned in Mr. Tozer's work. It is not yet possible to identify all the places the names of which are given in these remarkable documents, but it is quite easy to sketch the main trade and military routes between Egypt and Northern Syria, Western Mesopotamia, &c. About the fifteenth century before our era a certain Egyptian gentleman set out on a journey to Syria and, fortunately for us, he wrote an account of his experience to a friend wherein he detailed the events of the way, the names of the places at which he stayed, and several matters of considerable interest to the geographical student. M. Chabas' edition of the text and translation have been so long before the public that the Mohar's "itinerary" might well have been described by Mr. Tozer. Passing from Egypt to Babylonia and Assyria we think that enough of the early geography of these countries might have been gleaned from the cuneiform inscriptions to make two valuable chapters at least, as well as a tolerably full map.

Speaking of the pygmies (p. 30), Mr. Tozer says:

> "We may conclude therefore that the Pygmies of Homer were a real people. . . . The Egyptians might easily have heard of them, and through them the story might have found its way into Greece."

A little searching of Egyptian records would have shown him that the Egyptians knew a great deal about the pygmies, and that King Assa, about B.C. 3300, kept

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a pygmy, who had been brought from Central Africa by an Egyptian official called Bāurtet, at his court to dance and to amuse him. About seventy years later another king, Pepi II., sent a despatch to Heru-khuf, his officer commanding the garrison at Aswân or Syene, in which he promised him a greater reward than was conferred by Assa upon Bāurtet if he would go and bring back for him a pygmy "alive and in good health." In the inscription which covers the walls of Heru-khuf's tomb at Aswân (see Schiaparelli, "Una Tomba Egiziana," Rome, 1893), an account is given of the countries through which this brave officer passed, and though it is impossible to identify accurately all the places named, it is perfectly clear that, like the officer Una, he passed through the lands of great trees south of Khartûm, and so on to the districts described by Stanley ("Darkest Africa," i. p. 198; ii. p. 40) and Schweinfurth ("Im Herzen von Africa," ii. p. 131 ff.), to the land of the pygmies. The pygmies were so well known in Egypt that a reference to them is made in a version of the "Book of the Dead" of the sixth dynasty. In the temple at Karnak is an inscription of a later period which states that "the pygmies came from the lands of the south to do service in it," and in it, as in the earlier texts, no doubt can be entertained as to the correctness of the identification of the word *tenk* with "pygmy," for in each case it is followed by the determinative of a thick-set, stunted little man. We are hardly justified in assuming that the Egyptians had any dominion *de facto* in Central Africa, but there is no doubt that as far back as the time of the fifth dynasty they were well acquainted with the products and people of that remote land.

Again, on p. 21 the firmament of bronze which Mr. Tozer describes is nothing but the square metal plate which the Egyptians thought formed the sky and the floor of heaven, which was supported by four mountains or props placed one at each of the cardinal points; from this at night the stars were hung out like lamps, and in fact one of the names for stars, *khabesu*, means nothing but "lamp." The god Atlas is, of course, nothing but a Greek form of the god Shu, whose functions were to lift the sky up from the earth at dawn, to support it during the day, and to let it down again at night. The inscriptions of Egypt would similarly afford many an explanation of passages in Mr. Tozer's book.

Among minor matters it seems to us very doubtful if the name Samos is derived from the Semitic *shamah* (p. 5); the Arabic word *ḳasdîr* is, of course, derived from the Greek as Dozy showed (Suppl. ii. p. 355, col. 2); it is very doubtful if the names "Asia" and "Europe" are derived from the Assyrian words "to go forth" (of the sun), and "to set" (of the sun); the Peutinger Table was published in its entirety, and it is only Desjardin's description of it which is unfinished (p. 310); and we should have preferred the conical to the elliptical projection of Ptolemy's map given on the plate which faces p. 341. It only remains to say that so far as it goes Mr. Tozer's book is good, and that the classical portions of it have been carefully done; in a new edition we hope that the sources of the information which we obtain from Greek and Latin writers, and which may be traced to hieroglyphic and cuneiform records, will be duly described and set forth.

OUR BOOK SHELF.

La Teoria dei Raggi Röntgen. By Prof. Filippo Re. With two plates. Demy 8vo. Pp. 64. (Palermo: Alberto Reber, 1898.)

IN the first three chapters the author discusses the existing theories which regard Röntgen rays as longitudinal waves, molecular streams, and transverse waves of extremely short wave-length. He then proceeds to summarise the various hypotheses which have been advanced to account for the electro-dispersion of these rays, and their capability of bending round obstacles. Chapter vi. deals briefly with other kinds of new rays—namely, Becquerel rays, Le Bon's rays, and Winkelmann and Straubel's "spathofluoric" rays. A comparison of the properties of X-rays with those of Hertzian electric oscillations of considerable length, leads Prof. Re to propound the hypothesis that the former are electric waves of practically infinite length. This hypothesis, the author remarks, has close analogy with that proposed by Sir G. G Stokes at Liverpool, who suggested that Röntgen rays might be due to non periodic disturbances of the ether.

In attempting to show how this theory accounts for the physical properties of Röntgen rays, Prof. Re has, of necessity, left unanswered many questions which naturally suggest themselves, and in answering others has hardly made out a strong case in favour of his views. He attributes absence of reflection to the great penetrating power and diffusion of the rays, and absence of observed polarisation to the impossibility of arriving at any practical result with the means commonly employed; but these explanations can hardly be said to support the present theory more than any other. To account for cryptochröism the author has to suppose that, although the waves are of practically infinite length, their lengths are nevertheless of different magnitudes. We should have liked to see the question of the magnetic deformation of Röntgen and Lenard rays discussed in connection with the present theory. Why such rays should be produced by an apparatus so different from a Hertzian oscillator as a Crookes' tube, might also well be asked.

The author's familiarity with current research affords sufficient guarantee of his competency to put forward a theory possessing certain points of novelty. We are still so much in the dark as to the nature of Röntgen rays, that every new theory is worthy of the careful consideration of physicists. Without wishing to commit ourselves, the theory of electric waves of very great length strikes us at first sight as being no less plausible than many of the other hypotheses which have been propounded.

A Text-book on Applied Mechanics. By Andrew Jamieson, M.I.C.E., Professor of Electrical Engineering in the Glasgow and West of Scotland Technical College. Vol. ii. Pp. xiii + 388. (London: Charles Griffin and Co., Ltd., 1897.)

THIS text-book, of which this is the second volume, was written mainly for second and third year students of applied mechanics. Parts i. and ii., which form vol. i., deal with the principle of work and its applications, and gearing; the present volume, divided into Parts iii. to vi., includes motion and energy, graphic statics, strength of materials, and hydraulics.

The volume is divided into fifteen chapters, called lectures, though the ground covered in any one of them is generally much greater than any teacher would attempt in one lecture and numerous illustrative examples are given at the end of each chapter. It is refreshing to find the author introducing the calculus so freely into a text-book primarily intended for science and art students. In Part iii. the author discusses very fully such important practical questions as the energy of fly-wheels, engine governors, and the balancing of moving parts: the whole section is a very complete and good one. The next

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